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10/599,134

09/20/2006

Akinobu Miyazaki

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EXAMINER

ROBINSON, LAUREN E

ART UNIT

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1794

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/599,134	Applicant(s) MIYAZAKI ET AL.	
	Examiner LAUREN ROBINSON	Art Unit 1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 November 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 September 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>9/24/2008</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claim 1 is rejected under 35 U.S.C. 103(a) as being obvious over Mitsui et al. (US Pub. 2003/0129546) in view of Mito et al. (US PN. 6,589,894).

Consider claim 1: Mitsui et al. teach a dielectric paste and the method of making a plasma display comprising the dielectric paste (abstract). They also teach that the plasma display is a panel as illustrated by the figures within the reference (0019). Further, they teach that the panel is also comprised of a display electrode and an address electrode wherein the dielectric layer is formed on the display electrode (0068). Also, the dielectric layer is comprised of a glass powder (0056) which can be comprised of a mixture that can contain 6 wt% silica, 20 wt% boron oxide, 20 wt% zinc oxide, 38 wt% bismuth oxide and 4 wt% alumina (0105). However, they disclose that powder mixtures such as the one above for the same purpose within the reference can have 4 to 40 wt% zinc oxide and 10 to 85 wt% bismuth oxide (0058). Further, the reference does not disclose the need for lead oxide in the layer and therefore, this corresponds to

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the applicants' claim that 0 wt% PbO can be present. Although the above teaching is disclosed, the reference *is silent regarding*

-a specific composition comprising the elements above, wherein zinc oxide and bismuth oxide are within the claimed amounts,

- an RO compound according to the applicants' claim being within a mixture of all of the above compounds within the percentage range claimed or,

- the applicants' claimed ratios being met with a total of zinc oxide and bismuth oxide being between 35 and 65 wt%.

Consider a specific composition comprising the above silica, boron oxide, alumina, zinc oxide and bismuth oxide wherein zinc oxide and bismuth oxide are within the claimed ranges when specifically in the above composition

While the reference clearly illustrates an example of a composed glass powder comprising 6 wt% silica, 20 wt% boron oxide, 20 wt% zinc oxide, 38 wt% bismuth oxide and 4 wt% alumina which the examiner notes that not all of the above materials are present within the applicants' claimed ranges, the examiner notes that the teaching within the reference that the powder composition of the invention preferably has 4 to 40 wt% zinc oxide and 10 to 85 wt% bismuth oxide would make one of ordinary skill in the art recognize that although the specific example does not have zinc oxide and bismuth oxide being in the applicants' claimed ranges within the example, the compounds are capable of being present in an amount within the broad taught ranges wherein the examiner notes that the broad ranges of the zinc oxide and boron oxide overlap the applicants' claimed amounts. Therefore, while the reference does not specifically teach

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an example that includes all the applicants' materials being together in a single composition in the claimed amounts, one would recognize that the zinc oxide and bismuth oxide could be present in those amounts.

Also, the reference illustrates that the amounts of the zinc oxide and bismuth oxide within a powder composition are result effective variables as the amount of bismuth oxide will affect the firing temperature and the zinc oxide will affect the compactness and insulating resistance of the powder (0060, 0063). From this, it is the examiner's position that although the specific composition taught in the reference does not quite meet the limitations as claimed for zinc oxide and bismuth oxide within the above composition, one would recognize that the materials are capable of being present in a composition with the applicants' values and that if one desired to adjust the firing temperature, compactness, etc. of the powder, they would know that the amounts of the zinc oxide and bismuth oxide can be optimized to any amount within said preferable broad ranges (4-40wt% and 10-85wt%) in order to obtain desired results.

As such, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Mitsui et al. to include that the specific composition taught in the reference can have the amount of zinc oxide and bismuth oxide optimized to any amount in between the broad taught values (4-40wt% zinc oxide and 10-85 wt%), including being present in an amount between 26-40 wt% zinc oxide and 10-30 wt% bismuth oxide, in order to obtain desired levels of firing and compactness for the powder.

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Consider the RO compound according to the applicants' claim being within a mixture of all of the above compounds within the percentage range claimed

Although Mitsui et al. does not disclose that the specific composition which now as modified includes boron oxide, silica, zinc oxide, alumina, and bismuth oxide within the applicants amount ranges wherein PbO does not have to be present, the examiner notes that as illustrated in the reference Mitsui et al. desires to produce the glass powder dielectric paste to have a softening point of 600 degrees Celsius or less so that high sintering temperatures are not needed (0056).

Mito et al. teach a lead free glass powder composition used in flat panel displays (title, abstract) which can be in the form of a dielectric paste (abstract, Col. 1, lines 6-11). They teach that it is desirable for the glass powder to have a softening point of 630 degrees Celsius or less (abstract) and more preferable 600 degrees Celsius or less (Col. 5, lines 19-24) and that BaO can be used to lower the heat resistant temperature and make the softening point possible (Col. 2, lines 37-44) and that the barium oxide works with zinc oxide, boron oxide and silica within the composition to provide for a dielectric paste to be efficient for the above display panel purpose (abstract, Col. 2, lines 37-64).

Mitsui et al. and Mito et al. disclose analogous art related to a dielectric glass powder paste used for display panels wherein the paste preferable has a softening point of 600 degrees Celsius or less. While Mitsui et al. discusses that the bismuth oxide works with the other materials within the composition to lowering the softening point, it is the examiner's position that if one of ordinary skill desired to further lower the softening

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point temperature or have aid in doing so, they would look to the prior art for suitable materials that would be able to be added to a composition such as the one above and have the desired affect of lowing said softening point therein and during the addition, they would know that as illustrated in Mito et al., the amount of BaO is a result effective variable and therefore, one would recognize that depending on desired results such as the degree of further softening, etc. they would know that the amount of BaO can be optimized to any amount until the desired property is obtained.

Also, it is the examiner's position that one would recognize that if an additional material was to be added for the same purpose of the bismuth oxide, due to bismuth oxide working with specifically the silica, zinc oxide and boron oxide to allow for efficient properties for a dielectric paste for a display panel (0060-0063), it would be advantageous for the additional material to be able to work with the main materials of silica, zinc oxide, and boron oxide therein. As such, since Mito et al. teach that BaO can lower softening points while working with silica, boron oxide and zinc oxide in the same type of lead free dielectric paste composition for display panels as provided in Mitsui et al., it is the examiner's position that it would have been obvious to one of ordinary skill in the art at the time of invention to further modify Mitsui et al. to include that BaO could be added to the specific composition taught in Mitsui et al. in order to obtain further aid in lowering the softening point of the dielectric paste and as discussed, it would also be obvious to modify Mitsui et al. to include that the amount of BaO can be optimized to any amount including the applicants' wt % in order to obtain any further softening point desired.

Consider the applicants' claimed ratios and the zinc oxide and bismuth oxide totaling applicants' claimed 35 to 65 wt%

Further, while the reference does not include the specific ratios claimed or the total amount of zinc oxide and bismuth oxide, the examiner notes that one of ordinary skill would recognize that from the modification of Mitsui above, these values will be obtained through the above routine experimentation of zinc oxide and bismuth oxide amount optimization. .

This is due to the above modified composition includes 6wt% silica, 20wt% boron oxide, 4wt% alumina, and 0wt% PbO, with optimized amounts 4-40wt% zinc oxide and 10-85wt% Bi₂O₃. The examiner notes that using the above optimizable ranges will overlap values that meet applicants' ratios and total of zinc and bismuth oxides. For example, 30wt% of zinc oxide and 25wt% bismuth oxide along with the other components provide the ratios and total zinc and bismuth oxide amount below.

$$\text{ZnO}/(\text{SiO}_2 + \text{Al}_2\text{O}_3) = 30 / (6 + 4) = 3$$

$$\text{Bi}_2\text{O}_3/(\text{B}_2\text{O}_3 + \text{ZnO}) = 25 / (20 + 30) = 0.5$$

$$\text{ZnO} + \text{Bi}_2\text{O}_3 = 30 + 25 = 55$$

As such, through optimization of the zinc and bismuth oxide amounts within ranges that overlap applicants' necessary values, one of ordinary skill would recognize that the applicants' ratios and total would be obtained through the routine experimentation and provide a prima facie case of obviousness (**Claim 1**).

Regarding claim 5: As discussed and modified, Mitsui teaches a PDP comprising a display electrode and an address electrode wherein the plasma display panel comprises

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a dielectric layer formed on the display electrode. Also, the dielectric layer as modified includes 6wt% silica, 20wt% boron oxide, 4wt% alumina, 0wt% PbO, optimizable amounts of 4-40wt% zinc oxide and 10-85wt% Bi₂O₃, and any optimizable value, including applicants' range, of RO wherein R is one oxide of the claimed group. As illustrated, the above composition with the optimizable values, allows for substantially the same composition as claimed by applicants. However, while Mitsui discloses that 10wt% of bismuth oxide can be used, the reference does not include 9.5 wt%.

While the above 9.5wt% is not taught, the examiner notes that this would have been obvious. For instance, one of ordinary skill would recognize that 9.5 and 10 wt% are so similar that it would be expected in the art that both will have substantially the same effects and provide a prima facie case of obviousness. See *Titanium Metals Corp. v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985).

Further, it was discussed about that the amount of bismuth oxide is a result effective variable that changes the physical properties and although it is disclosed within Mitsui that 10wt% to 85 wt% is "preferred", one of ordinary skill in the art would recognize that the taught range is not limiting and if one desired to adjust the physical properties, they would know to do it by further optimizing the amount of Bi₂O₃. Therefore, through routine experimentation of optimization, desired results can be obtained. As such, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Mitsui to include that the amount of bismuth oxide can be further optimized to any value including applicants in order to obtain desired physical properties (**Claim 5**).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 2-4 are rejected under 35 U.S.C. 103(a) as being obvious over Mitsui et al. (US Pub. 2003/0129546) and Mito et al. (US PN. 6,589,894) as applied to claim 1 above, in view of Kosaka et al. (US PN. 6,207,268).

Consider claim 2: As discussed above, Mitsui et al. was modified to include the limitations of claim 1. However, Mitsui et al. is silent regarding a protective layer formed over the dielectric layer wherein the protective layer has MgO as its main component.

Kosaka et al. teach a transfer sheet for forming dielectric layers and forming plasma display panels (abstract). The reference teaches that the plasma display panel can be comprised of an electrode with the dielectric layer applied thereon and then a protective layer comprised of MgO applied on the dielectric layer (Col. 8, lines 53-67). The reference teaches that the dielectric layer is also considered an ink layer (Col. 9, lines 63-68) and the protective layer is used to prevent damage to the dielectric ink layer (Col. 12, lines 11-15).

Mitsui et al. and Kosaka et al. disclose analogous art related to plasma display panels comprising an electrode and a dielectric layer disposed on the electrode. As such, it would have been obvious to one of ordinary skill in the art at the time of

invention to further modify Mitsui et al. to include the protective layer comprised of MgO from Kosaka et al. in order to prevent damage to the dielectric layer **(Claim 2)**.

Consider claim 3: Mitsui et al. also teaches that the glass dielectric layer is cured at a temperature range of 140 to 300 degrees Celsius (0076) and heated at a temperature range in between room temperature (~20 to 23.5) and 500 degrees Celsius (0081). The reference also teaches that the glass powders used in the above layer are cured/heated at the above temperatures have a linear thermal expansion coefficient of $75 \times 10^{-7}/^{\circ}\text{C}$ (0105-0108). Due to this teaching and the above modifications, Mitsui et al.'s teaching now corresponds to applicants' claim 3 **(Claim 3)**.

Consider claim 4: The examiner notes that claim 4 is a product-by-process claim and according to the MPEP 2113 [R-1], the claim may be limited by and defined by the process, by the determination of patentability is based on the product itself and not its method of production. Therefore, if the product in the claim is the same as or an obvious variant over a product in the prior art although they might be made by different processes, the claim is unpatentable.

In the instant case, the reference teaches that the dielectric layer comprised of the glass powders discussed previously, is also comprised of a binder resin (0086) and can be comprised of an organic solvent (0073). The dielectric layer is formed on the electrode as also mentioned previously wherein the dielectric layer (Represented by "2" in Fig. 2) covers the electrodes (Represented as "1" in Fig. 2) and the layer is then baked by curing (0076), heating and firing (0081). Due to this teaching and the modified teaching of Mitsui et al., the reference now correspond to applicants' claim 4 **(Claim 4)**.

Response to Arguments

Applicant's arguments filed November 13, 2008 have been fully considered but they are not persuasive.

Argument 1: Applicants argue on page 4, last paragraph that Mitsui does not teach an amount of zinc oxide and bismuth oxide that produces the total amount of 35 to 65 wt% along with satisfying the applicants' claimed ratios.

This argument is not persuasive because as discussed in the previous as well as the above action, the amount of bismuth oxide and zinc oxide within the glass A of Mitsui which also includes 6wt% silica, 20wt% boron oxide, 4wt% alumina, and 0wt% PbO, can be optimized to any amount within 4-40wt% zinc oxide and 10-85wt% Bi₂O₃.

Due to the modification, it was illustrated above that the composition using the above ranges will overlap values that meet applicants' ratios and total of zinc and bismuth oxides. For example, 30wt% of zinc oxide and 25wt% bismuth oxide along with the other components provide the ratios and total zinc and bismuth oxide amount below.

$$\text{ZnO}/(\text{SiO}_2+\text{Al}_2\text{O}_3) = 30/(6+4) = 3$$

$$\text{Bi}_2\text{O}_3/(\text{B}_2\text{O}_3+\text{ZnO}) = 25/(20+30) = 0.5$$

$$\text{ZnO} + \text{Bi}_2\text{O}_3 = 30 + 25 = 55$$

As such, through optimization of the zinc and bismuth oxide amounts within ranges that overlap applicants' necessary values, one of ordinary skill would recognize that the applicants' ratios and total would be obtained through the routine experimentation and provide a prima facie case of obviousness.

Argument 2: Applicants argue on page 5, paragraph 2 that Mito does not disclose alumina and a glass composition including bismuth oxide and as such, fails to disclose the total and ratio limitations.

The above argument is not persuasive because although examiner agrees that Mito does not include these features, Mito was used as a secondary reference to include RO and as such does not have to include these features. However, as discussed, Mitsui as modified does now include applicants' total and ratios and all the limitations of claim 1 is met using the combination of Mitsui and Mito.

Argument 3: Applicants argue on page 5, third paragraph that claim 5 is distinguished from the prior art because Mitsui does not disclose applicants' 2 to 9.5wt% bismuth oxide due to Mitsui teaching a range of 10 to 85wt% and Mito does not disclose this feature because they fail to disclose using bismuth oxide.

The above arguments are not persuasive because regarding Mitsui, as discussed in the above action, although Mitsui discloses a preferable range of 10 to 85wt%, one of ordinary skill would recognize that the applicants' value of, for example 9.5wt%, is so similar to 10wt% within Mitsui, that they would expect the properties to be the same thereby, providing prima facie case of obviousness. Also, as discussed, one of ordinary skill would recognize that the taught 10 to 85wt% range is merely a preferable range, which is not limiting, and since Mitsui illustrates that the amount of bismuth oxide is result effective, one would optimize the amount to any value to obtain desired properties. As such, through routine experimentation, the examiner notes that applicants' values would be obtained.

Further, the argument regarding Mito not disclosing claim 5 due to not disclosing bismuth oxide is not persuasive because as discussed, Mito is being used as a secondary reference and therefore, does not have to teach every single feature. However, as Mitsui as modified above teaches the applicants' invention, the combination of Mitsui and Mito teach applicants' claim 5.

Argument 4: Applicants argue on page 5, last paragraph that Kosaka does not teach the applicants' invention of claim 1 which claims 2-4 require and therefore, does not remedy the deficiencies of Mitsui and Mito.

The above argument is not persuasive because as Kosaka is being used as a second reference, Kosaka does not have to teach each limitation of claim 1. Rather, it was illustrated that Mitsui as modified in combination with Kosaka, teach applicants' claim 1-4 and as such, applicants' argument is not persuasive.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the

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shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LAUREN ROBINSON whose telephone number is (571)270-3474. The examiner can normally be reached on Monday to Thursday 6am to 4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carol Chaney can be reached on 571-2721284. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Lauren E. T. Robinson
Examiner
AU 1794

/LAUREN ROBINSON/
Examiner, Art Unit 1794

/Timothy M. Speer/
Examiner, Art Unit 1794